approach

JANUARY 1981 THE NAVAL AVIATION SAFETY REVIEW

GROUNDED

By LCDR Chuck Carroll
HSL-36

TO the intrepid aviator, high on the list of fears is a single word – **grounded!** Simply put, no one wants their hard-earned flying privileges revoked on the perceived whim of a flight surgeon.

But let's look at the purposes and intent of a grounding notice. For whatever reason, medically you are no longer fully qualified for flight. Period. Would you fly a downed aircraft? Do you hesitate to write a downing discrepancy for fear the aircraft will go hard down? In the same light, the flight surgeon must restrict you from flying until your "discrepancy" is corrected. The grounding notice is the first step the medical folks must take to get you into their "maintenance" system. Of course, everyone has heard a horror story about "good ole Joe" who walked in with a minor ailment and spent the rest of his career fighting BUMED for an "up" chit. What happened to him in the interim?

The Navy has a tremendous investment in its aviators and is not capricious in keeping folks out of the cockpit. The medical establishment has a vested interest in your health and in your flying capability. When an individual complains of a problem, they make every effort to return that person to a flying status and to good health. In some cases, this can be a lengthy process due to a particularly difficult diagnosis, extensive or exotic testing procedures, or long term treatment. In most circumstances, however, it is not very long until you are back in the air.

Are the horror stories true? Did "good ole Joe" get a fair shake from the doctors involved? There are some cases that have involved extensive groundings, designator changes and/or disabilities, but these cases are extremely rare. When we look at the "big picture," aren't these cases in the best interest of the individual, our safety program, and naval aviation in general?

Ask yourself the following questions:

Do you want to fly when everything you can control is not 100 percent up?

Do you want to fly with a wingman or copilot who is less than 100 percent up?

Do you want a potentially serious illness to go untreated?

If you answered "no" to any of the above questions, then next time you have a medical problem, no matter how trivial you consider it to be or how many gruesome grounding tales you've heard, head on over to your friendly flight surgeon. You'll be glad you did.

Vol. 26 No. 7

approach

NAVAIR 00-75-510

Mr. Blake Rader painted the F-4 Phantom on this month's cover.

Contents should not be considered as regulations, orders, or directives and may not be construed as incriminating under Art. 31, UCMJ. Views of guest-written articles are not necessarily those of NAVSAFECEN. Photos are Official Navy or as credited. Photographs used have no strict relationship to the text. Official distribution handled by NAVSAFECEN, Safety Pub. Dept., NAS Norfolk, VA 23511. Phone: (804) 444-1321. Printed in accordance with Dept. of the Navy Publications and Printing Regulations, NAVEXOS P-35. Library of Congress Catalog No. 57 60020.

Improved

aircrew headgear

By Russ T. Forbush
APPROACH Writer
With the assistance of J. W. Castine
Naval Air Development Center

DURING the Vietnam conflict, feedback from the fleet was emphatic and often emotional – we need improved aircrew headgear! Reports and messages indicated that the mission effectiveness in high-performance aircraft was being compromised by the APH-6 helmet and A-13A oxygen mask. Furthermore, flightcrews' lives and expensive, sophisticated aircraft systems were being jeopardized. The deficiencies were identified as:

- Excessive weight and bulk.
- Poor fit and discomfort.
- Impaired vision.
- Instability under high G.
- Misplaced center of gravity.

All of the above deficiencies were accentuated when the F-4 Visual Target Acquisition System (VTAS) was installed on the helmet. The helmet problems in rotary-wing aircraft are similar and further accentuated by the long mission times.

Before a meaningful development program could be initiated, a reevaluation of headgear design philosophy was in order. Previously, design philosophy had emphasized Designed Function (protection) as the most important leg of the personnel equipment design triangle (Fig. 1). The Naval Aerospace Medical Institute (NAMI) concluded that there were four types of impacts most encountered in aircraft accidents. The effect of increased weight of headgear for each impact type was evaluated with the following results:

Type 1 Impact (increases protection). Helmet mass acts protectively as it is increased. Since force equals mass times

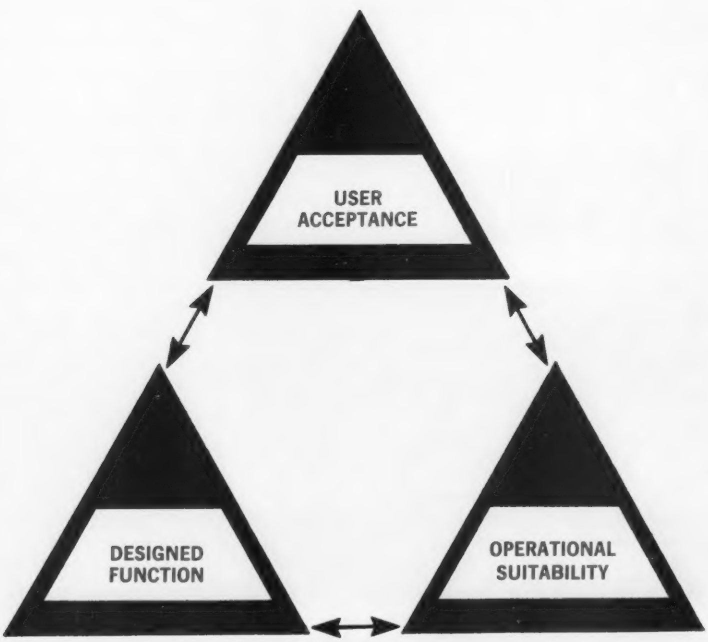


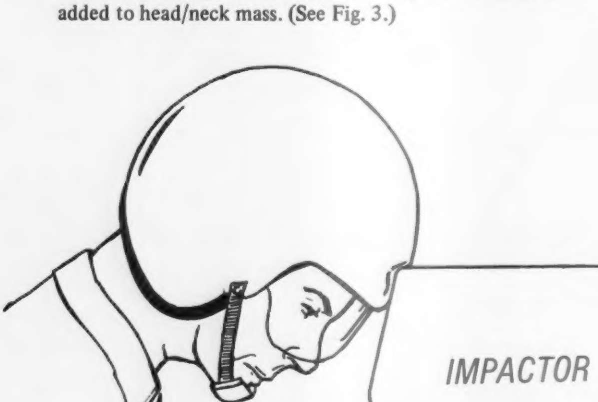
Fig. 1

- MOVING IMPACTOR
- FIXED HELMET/HEAD/NECK

Fig. 2

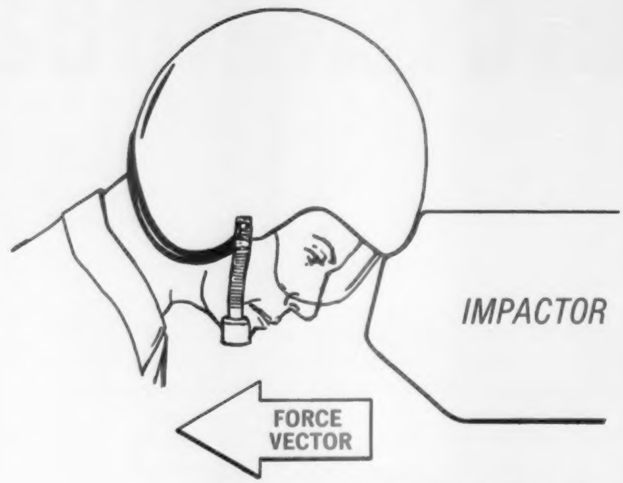
acceleration, if the mass is increased, then the imparted acceleration to head is decreased for a given impact force. (See Fig. 2.)

Type 2 Impact (decreases protection). For a given impact acceleration, the greater the helmet mass, the greater the force of the impact on the helmet, because helmet mass is added to head/neck mass. (See Fig. 3.)



- FIXED NON-DEFORMABLE IMPACTOR
- MOVING HELMET/HEAD/NECK

Fig. 3



- FIXED DEFORMABLE IMPACTOR
- MOVING HELMET/HEAD/NECK

Fig. 4

Type 3 Impact (increases protection). Army Aviation Laboratory studies noted this protective effect in their excellent analysis of the physics of impact testing methods and stated that, in impacts against deformable structures, the heavier helmet may have an advantage due to greater deformation of the structure by greater head/neck/helmet mass. Their analysis did not note the fact, however, that the deformation threshold of the helmet may be lower than that of the structure, thus causing injury. (See Fig. 4.)

Type 4 Impact (decreases protection). Increased helmet mass is again a detriment since, for a given acceleration, the greater the helmet mass, the greater the force exerted on the torso-neck hinge point in the absence of head-helmet impact. The possible physiological danger in this instance is neck injury resulting from cervical stretch, with linear and angular displacements of the head and neck due to the applied accelerations. (See Fig. 5.)

Clearly, lightweight helmets strengthen the User Acceptance and Operational Suitability legs of the Design Triangle. NAMI concluded that lighter helmets improved Designed Function (protection) in at least two of the most common impact types. Therefore, there was justification for considering lightweight helmets at the expense of military specification impact requirements. Further analysis concluded form-fit helmets would improve fit and stability under G-forces.

In an August 1978 letter, Chief of Naval Operations concluded that the APH-6/A-13A combination "no longer meets operational requirements." CNO directed that acquisition of the new lightweight helmets and masks be expedited and replacement of the APH-6/A-13A combination

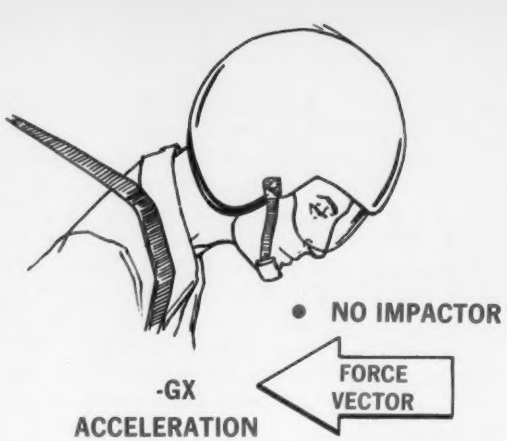


Fig. 5

be completed by July 1981. The HGU-33/P and HGU-34/P helmets and the MBU-14/P oxygen mask have been developed to replace the old combination.

The HGU-35/P Integrated Helmet/Oxygen/Communication System is being developed for use in high-performance aircraft with sustained high-G-load capability. The HGU-35/P OPEVAL will commence in March 1981. This is the final phase of test and evaluation prior to the production decision by CNO.

Both HGU-33/P and HGU-34/P helmets incorporate the PRK-37/P shell and EEK-4/P visor. Each type helmet may be fitted with either the PRU-39A/P form-fit liner or PRK-40/P pad-fit liner. The PRK-37/P helmet shell is similar in appearance and is contoured identically to the APH-6 shell. The shell is trimmed with a leather-covered foam edgeroll, and two USAF bayonet receivers are included with each shell. This shell is fabricated in the same manner as the APH-6, from patterned plies of fiberglass cloth which are bonded under heat and pressure with epoxy. The impact requirement has been reduced by 25 percent to allow lighter weight (fewer plies of fiberglass).

The EEK-4/P visor includes interchangeable clear and tinted lenses and a lightweight housing. The lenses are fabricated from windblast shatter-resistant polycarbonate with a scratch-resistant coating.

The PRU-39A/P form-fit liner is a field fabrication item. Fitting is accomplished at the organizational level of maintenance. The unfitted liner consists of a preformed leather covering and soft foam comfort pad cemented to a fiberglass backing with two small holes in the crown. The fitting fixture is merely a helmet shell with a large hole in the crown and a handle on each side. The unfitted liner is inserted into the fitting fixture. The aircrewman dons this assembly and adjusts the ear cups and helmet orientation. The rigger mixes the specified chemicals and pours them into the holes in the liner's fiberglass backing. When the foam begins to expand, the aircrewman pulls down on the handles to prevent the mixture from rising, and the rigger "scoops" away the excess foam. Within 20 minutes, the liner is set and ready for installation into the helmet shell. After the foam cures for 24 hours, the helmet is ready for flight.

The PRK-40/P helmet liner assembly consists of a two-piece polystyrene liner, fitting pads, and a nape strap. Planned product improvements for the HGU-33/P and HGU-34/P helmets include use of a logistically superior form-fit method and state-of-the-art materials, such as *Kevlar* (R) and graphite, to increase protection and maintain or reduce weight.

The MBU-14/P pressure-demand oxygen mask was developed from the USAF MBU-12/P oxygen mask. It incorporates USN communications and is designed to offer stability under G-forces, comfort, low profile, and light weight. The silicone rubber facepiece is bonded to a hard plastic shell and comes in four sizes. Included in the configuration are an inhalation/exhalation valve, soft oxygen hose, and offset bayonets. Planned product improvements include replacement of the bulky dynamic microphone with a miniature electret microphone which will eliminate the hazard of oral/dental injury in the event of an impact directly to the mask shell.

Procurement of components which comprise HGU-33/P and HGU-34/P helmets has already commenced, and initial outfitting of the mask and helmets will begin in February 1981 when the mask becomes available. It is expected that mask procurement will be completed in December 1981.

As previously stated, one of the deficiencies of the APH-6/A-13A combination is a misplaced center of gravity. (See Fig. 6.) This is a very serious problem in high-performance

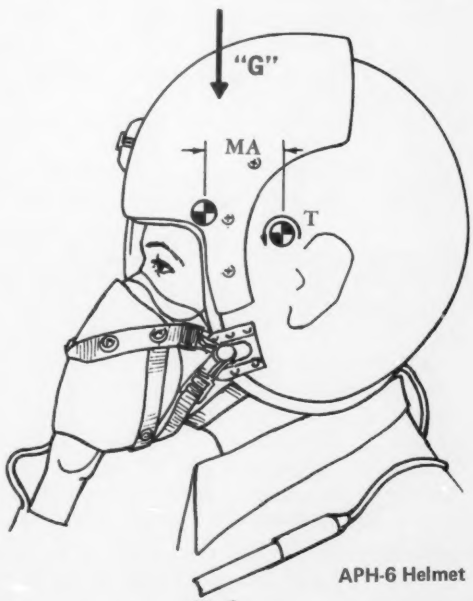
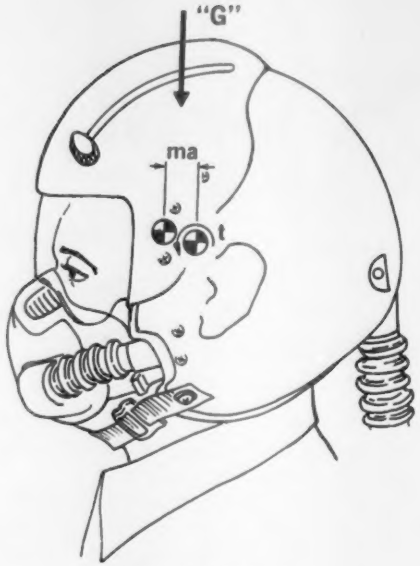


Fig. 6

APPROACH (USPS 016-510) is a monthly publication published by Commander, Naval Safety Center, Norfolk, VA 23511. Subscription price is $15.00 per year; $3.75 additional for foreign mailing. Subscription requests should be directed to: Superintendent of Documents, Government Printing Office, Washington, DC 20402. Controlled circulation postage paid at Norfolk, VA.

HGU-33/P and HGU-34/P Helmets
Fig. 7



HGU-35/P Helmet
Fig. 8

aircraft because the G-forces create a torque which restricts head movement and induces fatigue. The equation of torque is:

Torque = (G-force) x (helmet/mask weight) x (moment arm)

The moment arm is the distance between the center of gravity of the helmet and the center of gravity of the head.

For the APH-6/A-13A combination, the weight is approximately 6 pounds and the moment arm is about 6 inches (one-half foot). If the G-force is 6, then the torque is around 18 foot-pounds.

For the HGU-33/P and HGU-34/P helmets and MBU-14/P mask combination, the overall weight is approximately 4 pounds, and because the mask and visor housing are much lighter, the moment arm is about 4 inches (one-third foot). Thus, if the G-force is 6, the torque is around 8 foot-pounds (6 x 4 x 1/3) . (See Fig. 7.)

The HGU-35/P system is a low-profile, lightweight, form-fit helmet with integrated oxygen and communications subsystems. This system has been designed specifically for the requirements of a high-G environment, and head torque has been minimized. The overall weight of the system is approximately 3 pounds, and the moment arm is 1 inch (one-twelfth foot). Therefore, if the G-force is 6, the torque is 1½ foot-pounds (6 x 3 x 1/12). (See Fig. 8.)

The lightweight, high-strength components of the HGU-35/P are constructed utilizing state-of-the-art materials and manufacturing processes. The smooth contour helmet shell and visor cover are made of *Kevlar* (R). Five (clear, light tint, dark tint, gradient tint, and high-acuity yellow) exchangeable polycarbonate lenses are provided with each system.

The communication system features a high-quality miniature electret microphone, an amplifier, and high-impedance earphones (eliminating the need for a transformer). The microphone is a rugged, solid state transducer which offers long life, low vibration and electromagnetic interference (EMI) susceptibility, and environmental integrity. Unlike the M-94B/A dynamic microphone, the electret microphone is not noise-canceling. In the closed cavity of the oxygen mask, the dynamic microphone not only cancels noise but also reflects voice signals and does not significantly improve signal-to-noise ratio. The electret microphone has a rising frequency response that is desirable in an oxygen mask and enhances intelligibility. The result is a very clear and crisp voice transmission.

The integral oxygen subsystem features a new lightweight, low-profile mask, an internal oxygen duct through the helmet, and an external hose with communications wires connecting to the helmet at the rear. This configuration greatly enhances aircrew performance under high G-loading due to the reduction in mask weight and elimination of the front "elephant trunk" oxygen hose.

The combination inhalation/exhalation valve is used in both the HGU-35/P helmet and MBU-14/P mask. The valve offers the advantage of miniature size but does have slightly greater exhalation resistance. It is also more sensitive to dust and contamination.

Operation of the valve is very simple. It is installed in the mask hard shell so that one side of the valve "sees" mask pressure and the other side "sees" hose pressure. Upon inhalation, the pressure within the mask becomes less than the pressure within the oxygen hose, the flapper of the valve opens, and oxygen from the hose enters the mask. Upon

exhalation, the pressure within the mask becomes greater than the pressure within the hose, the flapper closes, the spring/diaphragm collapses, and the exhalation is exhausted.

The need for an improved helmet for rotary-wing aircrewmen is also recognized, and a program to accomplish this is underway. AH-1T *Cobra* aircrewmen were outfitted with lightweight, form-fit helmets with sight assemblies during introduction of the TOW missile system (Aug-Sep '80). The helmet shell is constructed from five plies of epoxy-bonded *Kevlar* (R) cloth. The ear cups are attached to the shell with *Velcro* (R) for greater adjustability, and the yoke-type chinstrap secured to the shell is rated at 300 pounds pull force (the current chinstrap fails at 125 pounds). The form-fit method used for these helmets is the same as that used to form-fit the HGU-33/P and HGU-34/P helmets.

An Engineering Change Proposal (ECP) is being prepared to improve rotary-wing aircrew helmets. The program will consist of two concurrent efforts – field modification of the SPH-3B helmets and introduction of improved components through attrition. Field modification of the SPH-3B helmet will accomplish the following:

- Replace the sling suspension and polystyrene liner with a form-fit liner, or
- Replace the sling suspension with fitting pads and nape strap.
- Modify the ear cups and the shell for *Velcro* (R) attachments and adjustment of the ear cups.
- Provide a yoke-type, shell-attached chinstrap rated at 300 pounds pull force to replace the present chinstrap.

Significant strides have been made to develop superior headgear for both fixed-wing and rotary-wing aircraft flightcrew personnel. But with the development of such helmet-mounted avionics devices as night vision, display, and targeting systems, the challenge for further development remains.

Ten Commandments of the Flight Deck

I Thou shalt never venture upon the roof during flight ops unless absolutely necessary, for thou knowest it is the most dangerous place on the sea.
II Thou shalt care for and monitor daily the status of thy flight deck gear as if thy life depended upon it, for it does.
III Thou shalt always endeavor to keep thy head on a swivel, lest the Phantom's tail or the Corsair's mouth hurt thee badly.
IV Thou shalt never be without thy flashlight at night.
V Thou shalt never walk or crawl under an **up** *tailhook.*
VI Thou shalt carry the gospel to all ends of the ship that the port catwalk is no-man's-land during launches and recoveries.
VII Thou shalt not anger the handler, nor the flight deck officer, nor the cat officer, nor the arresting gear officer, nor the air bos'n, nor anyone that is a servant of the boss.
VIII Thou shalt forever recognize thy responsibility, regardless of pay grade, to display common sense and a little initiative whenever thou observeth a safety violation in progress.
IX Thou shalt always be vigilant against thy incessant enemies: complacency, expediency, ignorance, fatigue, and FOD.
X Thou shalt never forget that the bottom line is to protect the national interests of our country. **GOD BLESS AMERICA!**

Submitted by VA-15

air breaks

Near-miss Awareness. The CT-39G was on an IFR flight plan, on an easterly heading at FL150, under positive control of Rice Paddy Approach. An F-4E was operating VFR, heading in a westerly direction, under the control of a local GCI site. His altitude was nearly identical to that of the *Sabreliner;* however, neither of the crews was aware of the other's presence, nor did the air traffic controllers realize the situation! A classic midair setup . . .

The weather was excellent, with a scattered deck at 3000 feet and the viz aloft unlimited; VFR all the way! The T-39 was returning to MCAS Rice Paddy from Rice Paddy AB. The *Phantom* was returning to the AB with an emergency (generator failure). As the F-4 turned left and descended toward the base, and before either pilot could take evasive action, the *Phantom* passed within approximately 200 feet of the *Sabreliner*!

Another "miss-is-good-as-a-mile" or "see-and-be-seen"? In this case, neither *saw* in time but, fortunately, *missed*. Aircrews are confident that ATC will keep them clear of traffic when flying IMC on an IFR flight plan. However, when pilots break out into the clear, they are exposed to the omnidirectional/omnialtitudinal VFR traffic that is seeking a piece of the sky that's rightfully theirs (they think). Hopefully, and fortunately most of the time, it's not the same piece. Controllers are not always able to report "pop-up" VFR traffic. In fact, as the VFR/IFR traffic load increases, VFR traffic advisories normally decrease. VFR or IFR, particularly if the weather is good, all pilots and aircrew must consciously keep their heads and eyes in the "scan" mode. It's one of the best assurances of avoiding midairs. Keep those eyes peeled, gang!

Red Hot Helo. Personnel were conducting maintenance on a CH-53D which was parked on spot 7 of the LPH flight deck. The blades of the aircraft were spread. Several men received static electricity shocks and reported the problem.

Certain portions of the aircraft were too hot to touch without physical discomfort, and one bolt on the tail skag of the aircraft could not be touched without danger of a burn. When a screwdriver or knife was passed along the tiedown chains, sparks could be seen.

Investigation revealed that the antenna adjacent to the aircraft spot was being used for HF transmission *(ANURT-23 HF transmitter plus ANURA-38 multicoupler transmitting in VCFT mode on a 35-foot whip antenna at 500 watts output on 6348 KHz).* As soon as it was secured, all symptoms ceased. It is surmised that induction of RF energy was taking place between the antenna, which was in the horizontal position, and the aircraft blades, one of which was almost parallel to the antenna at a distance of approximately 16 feet. No damage was done to the aircraft systems, and no injury to personnel occurred.

The hazards of RF radiation are well documented, and personnel aboard ship involved in the operation of electronic equipment are aware of the dangers. Mast head antennas are normally used for transmissions of the type involved in this incident but were unavailable due to maintenance. This, combined with the spread helo blades, resulted in the incident. It is recommended that ship's company personnel notify flight deck personnel prior to using deck edge antennae.

Switchology. It has been quite some time since a case of *improper switchology* has risen its ugly head, but the pilot of the TA-4 broke the string and got himself in a $2000 pickle (tank cost).

The *Skyhawk* was on an air-to-air gunnery mission, configured with one TDU-10 *Dart* aerial target on station 2, one 300-gallon fuel tank on station 3, and one 150-gallon fuel tank on

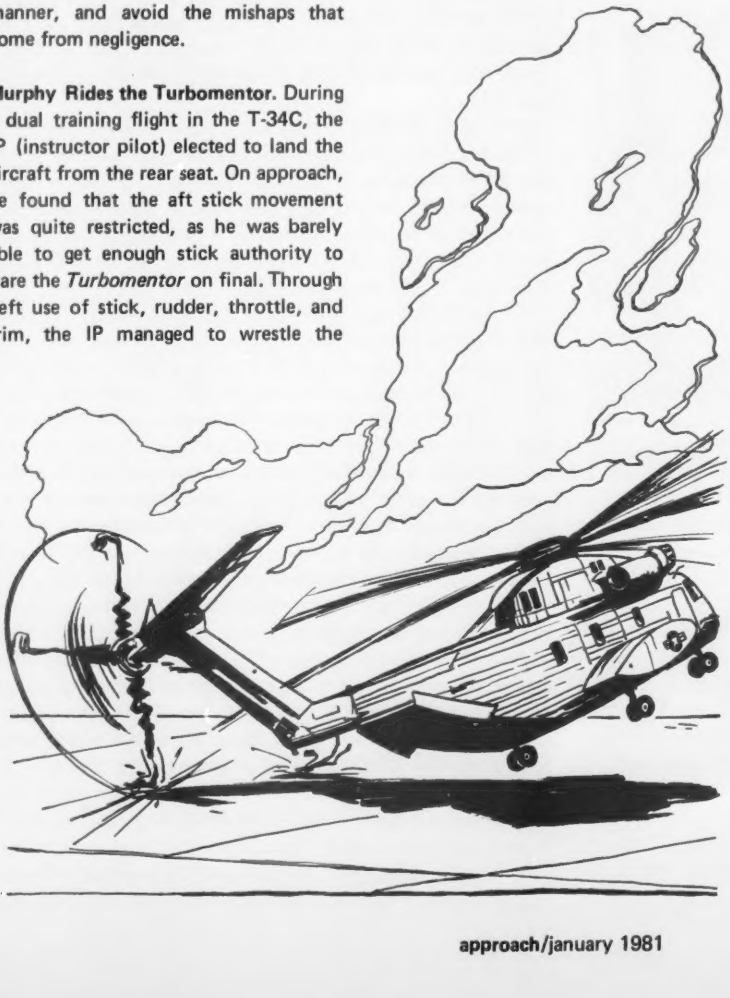
station 4. At 17,000 feet, 200 knots, the pilot attempted to launch the *Dart* but instead, the 300-gallon fuel tank on station 3 was "pickled" to the barren earth below. No damage to the aircraft or property was incurred as a result of this inadvertent jettisoning of external stores. The aircraft, not having enough fuel to complete the mission, returned to base. The slightly chagrined *Scooter* driver fessed up and admitted to selecting station 3 vice 2 prior to depressing the bomb pickle.

This was a classic case of improper switchology. Pilots — take your time when selecting stations! What's the hurry? You don't rush through preflight checklists, poststart checklists, pretakeoff checklists, or landing checklists (do you?), so why skip or hurry through ordnance checklists? Use all checklists in a timely and professional manner, and avoid the mishaps that come from negligence.

Murphy Rides the Turbomentor. During a dual training flight in the T-34C, the IP (instructor pilot) elected to land the aircraft from the rear seat. On approach, he found that the aft stick movement was quite restricted, as he was barely able to get enough stick authority to flare the *Turbomentor* on final. Through deft use of stick, rudder, throttle, and trim, the IP managed to wrestle the trainer to an otherwise safe landing, without further incident.

On postflight, the IP determined that the control stick had been restricted by the student's seat cushion, which had been placed on the forward lip of the front seat and had moved progressively forward during the flight. This was found to be a common practice, as most pilots feel that it makes the seat *tolerably* comfortable. (It sounds as though the seat/cushion was not "sailor-proofed" prior to fleet issue!)

Fortunately, this design deficiency is in the process of being remodeled to make the seat more comfortable and supportive. However, until then, pilots are reminded and encouraged to use the seats (as well as other equipment) as designed.



Tailfirst. The CH-53, with 24 passengers onboard, was making its approach to a tactical LZ (landing zone) on an island in the Med. The H2P (copilot at the controls) was in the left seat, being monitored by the HAC (pilot in command) in the right seat, for this cross-cockpit approach. The H2P started from a modified 180-degree position at approximately 30 degrees angle-of-bank. The *Sea Stallion* was held at this attitude turning final, still 250 feet AGL. As collective decreased, the nose was raised and the angle-ofbank reduced to 20 degrees. The stage was set and the helo established a classic nose-high, high-sink-rate attitude down to the inevitable.

As the landing spot was approached, the HAC called for power. Nearly simultaneously, he physically pulled up on the collective in an attempt to reduce the excessive sink rate and salvage the deteriorating approach. Nice try, but too late! The aircraft touched down in a nose-high attitude, with its tail skid striking the ground first. This action sheared the tail skid pin, which allowed the tail rotor blades to strike the ground. The HAC managed to wrestle the bird to the ground without further incident. Eight manhours, a tail rotor, and tail rotor drive train component change later (plus $48,000), the CH-53 was flown out of the LZ and back to Homeplate for a rest.

The cause of this mishap was obvious. A high sink rate coupled with a nose-high attitude, and an H2P that didn't recognize the deteriorating situation in time (even though the HAC did, but failed to react in a timely manner). They allowed the *Sea Stallion* to go "grazing."

This incident typifies another case of an aircraft commander recognizing, but not taking **immediate** control of the aircraft in a deteriorating situation. When such a situation is evident, do **you**, as the HAC, TPC, AC, PPC, or IP, exercise **your** judgment and responsibility in a timely and expeditious manner? Think about it, before **you** find **yourself** behind the power curve and in the proverbial "barrel."

Winter

SEVERE winter weather is already a fact in some parts of the United States and will move progressively further south during the coming months. Eventually, even sunny Florida will feel its bite.

If you're down in Pensacola, Corpus Christi, or other points south enjoying the balmy weather, you may not grasp the full implications of what the approaching cold weather means to you. You may have only vaguely acknowledged the coming of winter, expecting that as it becomes a reality, your friendly squadron safety officer will take the time to brief you on how it will affect local ops.

Therefore, it may take some forceful thinking on your part to imagine yourself touching down in the near future on an ice-glazed runway or peering through a frosted windscreen while trying to cope with a max crosswind. Face it, because it's going to happen to quite a few naval aviators during the next few months. The point is to not let it happen to you unexpectedly. Recognize now that an extended flight has the potential to place you in some honest-to-goodness winter weather, regardless of the point of origin within the states.

Be *prepared* – that is the key! Meticulous IFR cross-country planning – always the mark of the professional – now becomes acutely important. Being prepared for the flight requires more than spending 10 minutes in the flight planning room and 5 minutes in meteorology just prior to flight. It means allowing sufficient time to plan the flight properly. In fact, prior to route planning, take the time to thoroughly review cold weather operations. Break out the NATOPS Flight Manual and see what it has to say on the subject. In addition, get together with some of the more experienced pilots and have a series of heart-to-heart talks about the aircraft and cold weather. Suggested topics should include:

- **Baggage Stowage** – This is usually a problem in single-engine aircraft. Stow so as not to create a hazard to the opera-

weather warning

tion of the aircraft. Don't overload. In multiengine aircraft, ensure that articles such as LPAs/survival vests which contain flares, CO_2 cartridges, etc. are not located near heater vents where they may be actuated by excessive heat.

• **Aircraft Servicing** – Besides knowing the fuel and oil grades required for the bird, also find the specs for deicer fluid, defrosting compound, etc. Know how to check for moisture in the fuel. Any water can separate and settle to the bottom of the tank. At temperatures below freezing, it will crystallize on fuel drains and internal valves. This could result in the inability to transfer fuel in flight and lead to fuel starvation. Know how to drain engine fuel strainers and drain cocks, as this duty may fall upon you personally during the trip.

• **Cold Weather Starts** – Know preheating procedures, starter operations, external power usage, and what should be done on start if the oil pressure starts zooming towards the red line.

• **Ice and Snow Removal Before Flight** – Know the approved methods for removing ice and snow from your aircraft. When the aircraft surfaces are deiced, ensure that water is not allowed to collect in and around control surfaces where it might refreeze and adversely affect controllability of the aircraft.

• **Deicing Systems** – Know everything there is to know about how the aircraft is deiced in flight. Failure to know could lead to disaster if you're confronted with icing conditions.

• **Aircraft Heaters** – Review procedures for their operation.

• **Carburetor Heat** – Know when to use it and how to use it. Be sure to understand what its use does to your power, fuel consumption, and range.

• **Oil Dilution** – If your aircraft is equipped with oil dilution, be thoroughly familiar with its operation.

• **Landing Gear** – During taxi, avoid stopping the aircraft for any appreciable time in deep snow or slush. Moisture may get into brakes and freeze. Recycle landing gear several times after takeoff to prevent freezing during flight.

• **Wing Slats** – If snow, ice, or other precipitation is encountered during flight, the strong possibility exists that the slats will freeze in the retracted position. This will mean higher approach speeds on landing.

• **Turbojet Engine Icing** – Know the icing characteristics of your aircraft engine. Know how to recognize engine icing in flight and the operational procedures for minimizing or reversing it.

• **Takeoffs** – You will probably have more thrust available because of cooler, denser air. This can be more than offset by other factors, however. If there is an accumulation of snow on the runway, plan on a substantially longer takeoff roll. Any form of precipitation on the lifting surfaces constitutes a major hazard. This will require higher takeoff speeds and may cause treacherous stalling characteristics. Brakes may be ineffective, and takeoff in a slow-to-accelerate single-engine aircraft without nosewheel steering can be critical; in a high crosswind, it may be impossible.

• **Landings** – Landing on a wet or icy runway can be a very hazardous undertaking, depending on the specific conditions. Landing rollout will be appreciably increased. Plan on this and know the location and type of arresting gear available, if needed. Be well acquainted with proper flap management and braking technique.

This discussion of winter weather flying has been both general and brief. All flightcrews should research these and other pertinent subjects relating to winter weather in greater detail. Careful preflight preparation for the specific demands of winter weather will go far towards ensuring safe flight during the coming months.

By Glenn Smith
Naval Air Systems Command

Helicopter shipboard

FOR 10 years, the Navy has been flight-testing helicopters at sea to determine the maximum launch/recovery and rotor engage/disengage wind limits for particular helicopter/ship combinations. The Naval Air Systems Command (NAVAIR) named the resulting form of flight limitation "Dynamic Interface "(DI) envelopes. Other terms that mean exactly the same thing are: wind envelopes/limits/charts/diagrams, launch and recovery envelopes, etc., and rotor engage and disengage envelopes, etc. All of the existing envelopes appear in NWP-42D, "Shipboard Helicopter Operating Procedures" (NOV '79). Since some confusion still exists as to how to interpret some of these envelopes, I've written this article to explain them.

The envelopes basically are: NAVAIR's best attempt to define the maximum launch, recovery, or rotor engage/disengage wind limits for a particular helicopter/ship combination. I say "attempt" because, unfortunately, they sometimes are not as large as we want them to be. The Naval Air Test Center (NAVAIRTESTCEN) does not always encounter the absolute maximum wind and sea conditions when attempting a DI test. Therefore, certain whole envelopes and parts of some other envelopes do not reflect the maximum helicopter/ship capability. This is why some envelopes have very small ship pitch/roll limits or very narrow wind azimuth limits. It's also why some pilots feel that:

- Some envelopes are overly restrictive.
- Restrictive envelopes can be safely exceeded/ignored.

Certification and waiver are terms that are frequently confused with DI envelopes.

Certification: Certification addresses ship facilities and has nothing to do with wind envelopes. Certification addresses the status of visual landing aids, clearances, mooring aids, communications, servicing, maintenance, VERTREP equipment, fire bottles, and other items that affect a ship's ability

to support helicopter operations. The Naval Air Engineering Center issues certifications for individual ships and publishes all certifications in NAEC-ENG-7576, "AIR CAPABLE AND AMPHIBIOUS AVIATION SHIPS AIRCRAFT FACILITY RESUME." A ship may be certified without having any wind envelopes. Certification criteria and management are handled by Zeke Ziemer, NAVAIR Code 5511F, A/V 222-3242.

Waiver: CINCPACFLT or CINCLANTFLT may issue a waiver to an uncertified ship to satisfy a particular operational requirement. Generally, a waivered ship meets all the essential particulars for certification but may be waivered for any deficiency. Waivers are usually issued for a specific time or particular operation. A waiver authorizes helicopter operations from a noncertified ship regardless of any wind envelope. Waivers are issued with the concurrence of the surface and air type commanders.

wind limits

Clearance: Clearance has many meanings. There are clearances to take off, land, go around, come aboard, etc. For the purpose of this article, clearance means a flight clearance. NAVAIR defines a flight clearance as a message or letter originating from NAVAIR that addresses flight operating limits. DI envelopes are flight clearances. They are sent by letter to NAVTACSUPPACT (CNO's NATOPS rep) who publishes them in NWP-42.

Look at Fig. 1. Here is a good example of uncooperative weather during NAVAIRTESTCEN's SH-2F/DD-963 DI tests. The test pilots felt they could have gone a lot further but couldn't get high ambient winds to give them a higher relative wind over the deck and a high sea state. Let's look at the parameters:

Ship Pitch/Roll: Five degrees of ship roll is pretty low, and the 1-degree pitch was so unacceptably low that NAVAIR had to add a note allowing 4 degrees under certain conditions. So what can you do if the winds are within the envelope but you have a 7-degree ship roll and 3-degree pitch? Or 10-degree roll and 5-degree pitch? Ask the ship to minimize the pitch and roll and take winds 5-10 knots inside the envelope? Or try the old gouge of 30 degrees port at 30 knots? If these rules don't work, use your best judgment. We simply don't know what happens outside the present envelopes. The wind envelopes are guaranteed safe only within the pitch/roll limits.

Launch Only Section: The original envelope was so small that we extended a *launch only* part to expand it. Does the expanded part mean that you can launch at 320 degrees/35 knots, but not land at that condition? Yes, as far as our limited testing goes. With more testing, we can eliminate the "launch only" area and replace the whole envelope with a larger launch and recovery envelope. We are trying to do this now.

Gross Weight: Gross weight is deliberately not a factor for the SH-2F envelopes and is not presented. All SH-2F envelopes

SH-2F Launch and Recovery Wind Limitations

DD 963 CLASS SHIPS

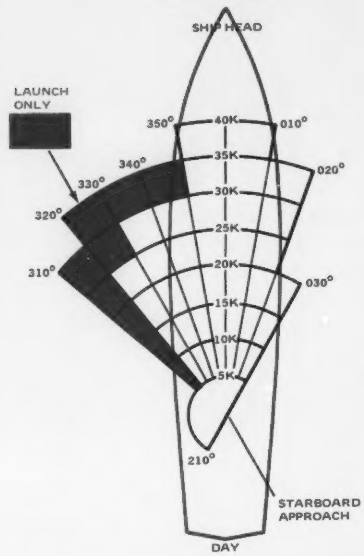
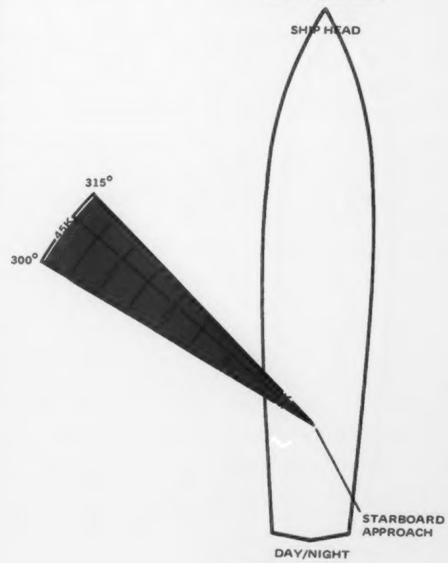


Fig. 1

(FROM NWP-42 (REV. D), PG. B-30)

SH-2F Recovery Wind Limitations

CG 26 CLASS SHIPS



(FROM NWP-42 (REV. D), PG. B-23)

Fig. 2

are good for 12,800 pounds.

Striped Border: An envelope enclosed by a striped border is a recovery-only envelope to be used for the emergency conditions listed under the picture (for this one: single-engine or ASE failure or boost failure or ship's VLA failure). Some emergency envelopes don't include single-engine or VLA failure because they weren't always tested. (See Fig. 2.)

Minimum Wind Over Deck: The two wind envelopes (on the ship outline) present the maximum wind over the deck. The graph to the right of these presents the minimum acceptable wind over the deck for safe operations. This minimum WOD was obtained from the performance charts at the back of the NATOPS. The graph ensures a 10-percent torque available margin. Its use is mandatory. (See Fig. 3.)

Gross Weight: Gross weight is definitely a factor for H-3 ship operations. Figure 3 only applies to SH-3D/H gross weight between 19,500 and 20,500 pounds. Other envelopes are provided for other gross weights.

Red Lights: Red lights yield a smaller envelope than white lights. Therefore, this envelope specifically states the test conditions: red lighting. In NWP-42D, the envelope to the right of this one depicts the white lighting envelope, which is significantly bigger. In cases of apparent conflict or confusion, white ship lighting can always be used with an envelope that is labeled "red lighting." A "white lighting" envelope can never be used with red ship lighting. (See Fig. 4.)

GSI Operating: This envelope was developed with the GSI operating and is labeled so. It is not valid unless the GSI is operating during recovery. It is valid for GSI ON or OFF launches. An envelope labeled "NO GSI" is valid for launches and recoveries with GSI ON or OFF. (See Fig. 4.)

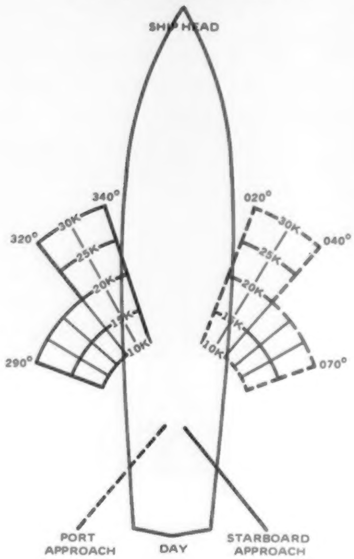
Shaded Areas: Shaded areas generally mean a night envelope. They are designed to be quickly distinguishable from day envelopes by contrast. For both the SH-3 and the SH-2, shaded areas represent night envelopes unless they are specifically called out differently for an individual envelope.

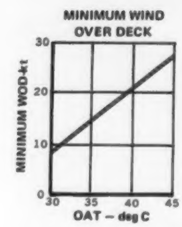
Why doesn't NAVAIR publish all the envelopes the fleet needs now? We're trying! Our biggest problems are not being able to get a ship to test and obtaining money to test the helicopter. Send messages saying whether or not you need these tests – that is the only way to obtain test ships and money. Call me if you have envelope questions/problems: Glenn Smith, A/V 222-3598/9.

SH-3D/H Launch and Recovery Limitations

(NIGHT OPERATIONS AUTHORIZED ONLY DURING EMERGENCIES)

AE 26 CLASS SHIPS
GROSS WEIGHT: 20,000 LBS (∓500 LBS)





Use entire envelope for ambient temperatures of 30°C and below. Increase minimum wind over deck as temperature increases.

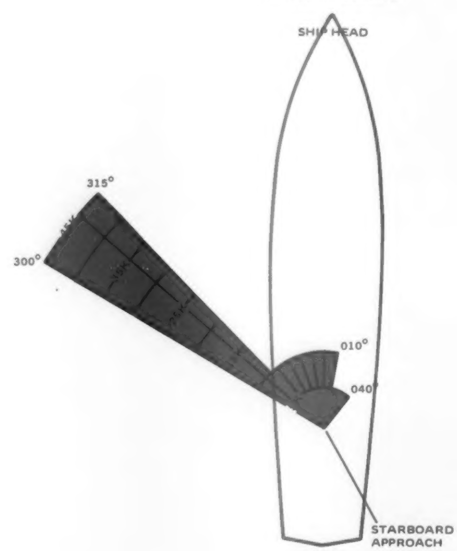
0 - 2 DEG SHIP ROLL
0 - 2 DEG SHIP PITCH

(FROM NWP-42 (REV. D), PG. B-39)

Fig. 3

SH-2F Launch and Recovery Wind Limitations

CGN 38 CLASS SHIPS



0 - 8 DEG SHIP ROLL
0 - 4 DEG SHIP PITCH
RED LIGHTS
GSI OPERATING

(FROM NWP-42 (REV. D), PG. B-25)

Fig. 4

Putting pilots, passes, and Paddles in perspective

By LT Dan Carroll, LSO
VF-124

CARRIER aviation in itself is not inherently dangerous. Now before everyone begins raising the B.S. flag, turn the transmitters down and the receivers up. By design, the safe and expeditious launch and recovery of aircraft on an aircraft carrier is just that – safe and expeditious. Danger does not exist when the game plan is followed. A problem can arise, however, when we consider the human error potential associated with pilots, their passes, and Paddles' attempts to control these two variables. This introduces the possibility of departing from safe operations. Taken within the latter context, carrier aviation can be dangerous. A contradiction? No, I don't think so. Why? Because it is perfectly safe to catch the 3 wire on the way towards your OK pass, but it's very dangerous to hit the ramp. And a ramp strike was just never meant to be a part of carrier aviation. It is certainly not safe and hardly expeditious. Yet there remains no existing guarantee that landing accidents are a thing of the past. We can go a long way towards making zero landing accidents a realistic goal, though, by developing a strong interface between pilot and LSO, with a keen understanding of the limitations of both.

Developing a strong interface between pilot and LSO requires a kind of mutual admiration society. A pilot must have confidence not only in himself, but in Paddles as well. You **have** to trust that guy out there on the platform. Not only does he work for you, but he is trying to make you an ever-improving carrier aviator. On the other hand, the LSO trusts that you as a pilot will get that good start **every** time. He has to have the confidence that pilots will respond properly to calls that are advisory and/or mandatory in nature. When performed properly, it is teamwork of the highest order. It is part and parcel to the safe and expeditious recovery of aircraft. There is no danger here, for professionals are at work. But the partnership that forms this teamwork must be capable of recognizing its own limitations. A pilot is only as good as his next pass. He has to know when he is approaching his limits and not **at** his limits. Likewise, an LSO cannot saturate his ability by allowing an approaching aircraft to exceed his limitations, thereby rendering the waveoff lights a useless tool that merely adds another shade to the color of failure.

Putting this into its proper perspective, we see the requirement for error elimination via the human redundancy in the interface between pilot and LSO. There must be a combined awareness of the proper techniques required and the necessary parameters. The highest level of motivation must be maintained to ensure avoidance of complacency. (Perhaps flight pay should be structured to include bonuses for OK passes and 100 percent boarding rates, and fines imposed for waveoffs and bolters.) But the bottom line is this: **We are PROs!**

We are among the very few people in the world who perform carrier aviation for a living. It is a process that requires striving to be the absolute best you can be. If your carrier aviation ability is not a part of this process, don't wait to be a part of the problem. It's not flying, but the nature of the people involved, that can be dangerous.

What? Hank *killed?*

By LCDR James E. Novitzki
Aviation Safety Programs
Naval Postgraduate School

THE other morning I was reading some of the morning message traffic and was shocked to see one of the initial accident report messages that was there. One concerned a good friend of mine, Hank Samuels. I quickly read through the message to see what had done old Hank in, for in fact he, his copilot, and several passengers were all killed. I was sure that something catastrophic must have happened to Hank. He was too professional a pilot to make a "typical" pilot error.

Before I discuss the accident itself, let me tell you a little about Hank the pilot. He had received his wings in 1966 and had been the number two man in his class. He had gone to fighters and had made two combat tours to Vietnam. Throughout his career, he had been marked as a charger and an extremely qualified pilot. He had a tour of duty with the Flight Demonstration Team and had also been to Test Pilot School. There was nothing that he could not do with an airplane, if it could be done, and he knew it. In his career, he had flown over 3,000 hours and had 600 carrier landings. Yet he had an additional quality that set him a mark above many of his contemporaries – judgment. He knew he was good, but in the 15 years that I knew him, he never felt the need to show off. Hank felt there was a right way and a wrong way and that the only way to fly was the right way.

Okay, you say, why am I wasting your time telling you all this? Because it's important. The final accident report showed conclusively that the accident was Hank's fault just as surely as if he'd been flathatting or doing any of the myriad things that pilots have done since there have been airplanes to show off in. How could such a thing happen to Hank?

Two years ago Hank was ordered to a staff job. From that job he could expect orders to a squadron as commanding officer. The immediate question for Hank was, "What do I fly while I'm here?" The answer was the station's twin-engine transport. The station ran a shuttle daily between several other bases, and once or twice a week, Hank could fly the shuttle. He wasn't all that enthused about it, but he accepted the new aircraft as a challenge and, in almost record time, became fully qualified as an aircraft commander.

I talked to Hank soon after he had been designated aircraft commander and he mentioned that the route was so boring that, after the thirty-seventh time, he felt he could do it blindfolded. He still did things professionally, but he felt that there was no challenge and no threat in the flying that he was now doing. He said, "After all, what can happen with two engines in a plane that flies this slow and when all your approaches are to runways 7,000 feet long or longer?" He said that "if we had an inflight emergency, we could remain at altitude, read the manuals, and practically land tomorrow after a good rest." Yes indeed, what could go wrong?

The weather along the route of flight was barely IMC. Most areas were 600-1,500 feet scattered to broken clouds, with the visibility 2-5 miles in haze. The weather was of no concern to the two pilots. Both had been over the route more than 50 times. The approach was TACAN from the southwest with an arc to a 10-mile straight-in. Radar vectors were normally provided to final, so even this approach should not be difficult.

The final accident report indicated that the cause of the accident had been pinpointed because this particular aircraft had a cockpit voice recorder installed as part of an evalua-

tion program. The recorder had been found undamaged in the wreckage. What follows is a summary of what was on the voice tape.

The significant part of the tape started at 1032 with a call from Center to "descend to 5,000 and switch to Approach Control frequency." There was a lot of talking back and forth between Hank and the copilot, a man with over 20 years flying experience. Approach Control was called and the friendly cockpit banter continued. Approach Control cleared the flight to 2,500 feet. As the descent continued, an altitude warning beeper, indicating a preset altitude had been passed, was heard momentarily in the background with the two pilots still talking about their likes, dislikes, government, etc. The tape indicates there was no attempt to level off at the altitude, presumably 2,500 feet. Approach Control called and cleared the aircraft to descend to 1,500 feet when 12 miles from the airport. The banter continued, and again in the background, the altitude beeper was heard, presumably this time set for the 1,500-foot restriction. Again, the descent appeared not to have been stopped.

A few minutes later, Approach Control called, "Switch to Tower; cleared to descend to 700 feet when passing 5 miles." Hank asked the other pilot to check the gear and flaps and he then called the tower. About 30 seconds later, Hank asked the other pilot, "See that high tower over there? Is that the TV tower?" "No," the other pilot said, "I'm pretty sure we're closer than that; I think it's that little radio station's tower." In the background, the altitude beeper sounds. Was it now set for 700 feet? "Did you notice the DME before it started to spin? I didn't." Hank called the tower, who cleared them to land. The other pilot commented, "Yeah, if we could just find the airport."

"You know if that was the TV tower . . ."

"No, it couldn't be, I'm sure that we're much closer than that."

Hank said, "But if it was, then the field must be there to the . . . " Smash!! The plane crashed into the side of a small hill 3 miles short of the runway. The top of the hill was less than 200 feet above the surrounding terrain.

What killed Hank? It wasn't enemy fire, bombs, carrier landings, material failure, explosion in flight, or any of the many reasons we all think of as reasons for fatal accidents. This time the killer was not so obvious. It was a problem that can strike any pilot at any level of experience. It allows other things to develop. It can affect the new pilot after his first few solos, the pilot with 500-800 hours who has "seen it all," the pilot with 1,800 hours who has been at a desk but remembers how easy it was, and lastly, the Hanks – they've done it so long, so well, they don't ever stop to think that maybe they can't do it.

The next time you fly, think about it. Do you really remember all the emergency procedures? What would happen "if"? Do you really need the ADF tuned to that soft-music radio station? Do you really care if John or Jack or Bill did or didn't do or get something yesterday? Or what happened to Bob's kids last week? Do they really care about the great flight you had 2 years ago when . . .? Are these things really important when you're flying, especially when you're shooting an approach? Maybe you should pay more attention to what the aircraft is doing and less to those in the cockpit with you. Think about it. It could happen to you!

Do you have the rhythm blues?

By CDR V. M. Voge, MC
Naval Safety Center

EVER hear of "circadian rhythm"? Probably not, although it is an extremely important consideration in deployments and night ops. Don't worry, it has absolutely nothing to do with things such as the monthlies, biorhythms, or birth control systems for grasshoppers. It simply refers to your own private 24-hour clock. Over 100 bodily functions have been directly related to this cycle, which varies from 20-28 hours in length (depending on the individual), is reset daily, and varies from individual to individual and even within the same individual. The basic trend of the rhythm does not vary, however.

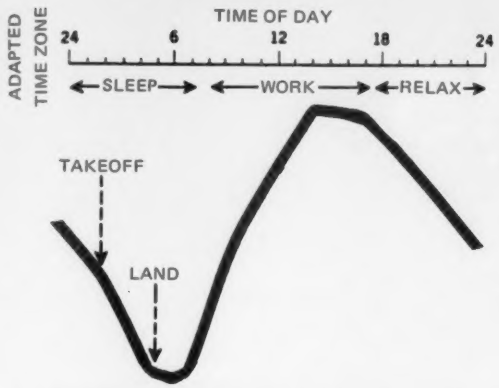
"All right," you ask, "what is it?" Well, to start with, the word "circadian" comes from two Latin words: "circa" – about, and "dies" – day, which explains the variable 24-hour cycle we mentioned above. Since over 100 bodily functions have been directly related to this 24-hour clock, the curve will vary a little for each function. We will consider two functions that follow basically the same curve – body temperature and performance.

If you were to take your temperature at about 1400 and then again at about 0400, providing you sleep during the usual nighttime period and get up about 6 or 7 a.m., you will find that it basically follows the curve in Fig. 1. "But," you protest, "of course my temperature is higher during the day – I'm working!" Not so! If you were to, let's say, have an inopportune night hop, land at 0400, and then sleep between 1000 and 1400 the next day, the same basic curve would hold true. In other words, it is not upset by such things as temporary external time shifts.

Since we all are in the performance business, we will spend the remaining space discussing effects on your performance. There are basically two types of performance-related circadian rhythm problems: the so-called phase-point problems, and the phase-shift problems.

An example of a phase-point problem is when you are fortunate enough to get stuck with a 2400 brief and 0100 takeoff for a 3-4-hour flight. Sound familiar? You may try to get a few hours sleep from 1700 to 2100, but you really can't sleep well because the sun tells you it is not the time to sleep and your stomach soon calls you to reveille. No matter. You know you'll be in good shape for the flight, right? Wrong! Look at Fig. 1 again. Your takeoff is scheduled for 0100. Your performance, according to the curve, is on a definite downswing. No matter, a couple cups of coffee will fix everything, right? Wrong! We'll discuss this a bit later. Look at Fig. 1 again. Your 3-4-hour flight will put you back in the landing configuration when you are at your absolute lowest ebb, performance-wise. You generally will have no real warning of this, except for feeling a bit tired, perhaps. What about the coffee? Coffee is a stimulant, but its effects last 3-5 hours in the normal individual. After this time, you are subjected to a lower than normal level of alertness. That is why you generally feel the need for another cup of coffee every 3-4 hours. Time your coffee intake right, and you'll be landing about 3 or less hours after the last cup. You may come out ahead, unless you're a heavy coffee drinker. Although your level of alertness is brought up by a new cup of coffee, it never reaches the

THE PHASE-POINT PROBLEM

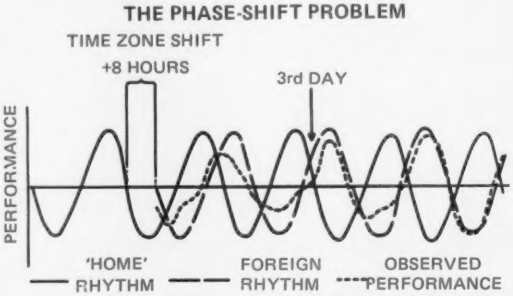


REPRESENTATIVE CIRCADIAN CYCLE FOR PERFORMANCE

(Adapted from Mohler, et al)

Fig. 1

THE PHASE-SHIFT PROBLEM



(Adapted from Klein, et al)

Fig. 2

previous level of alertness. Drink enough coffee and you'll find yourself behind the power curve!

Other problems? Just one more we worry about. Caffeine has a dehydrating effect, i.e., you urinate more than normal. This may cause a further performance decline. Also, if you fly a "non-relief tube" aircraft, you may find yourself a bit uncomfortable!

"Okay, Doc, now that you've got me worried about flying at strange hours, what can I do to control my circadian rhythm problems?"

Nothing! (Sorry about that!) We can only give you some good, general advice. First, the big one is **be aware of the problem!** If you realize your performance is going to be down when you land at 0500, you can compensate for it. Simply being aware of the problem will produce an extra spurt of adrenalin in your body that should help you over the crisis.

Second – **avoid fatigue.** This is **very** important! Get enough sleep when you are able. Usually, when you have a circadian rhythm performance debt, added fatigue does **not** have an **added** effect on performance decrement but has what we call a synergistic effect, i.e., a **multiplied** effect. So, be careful of this.

Third – **avoid smoking.** The more you smoke, the more hypoxic you become. The more hypoxic you become, the less oxygen goes to the ol' brain, and the less oxygen to the brain, the greater the performance decrement!! Don't increase your liabilities!

Fourth – **don't overdo the alcohol routine.** "But, isn't it 12 hours from bottle to brief?" Not really. This is an area that will be discussed at another time. Even if all the alcohol is out of your blood, you still have a "hangover effect" which, loosely translated, is fatigue.

Fifth – **remember the short term effects of stimulants** (coffee); and sixth – **follow a normal routine and avoid excesses.**

"Okay, I get it. But how does this affect deployments?" Well, now we're to our second circadian rhythm problem area, i.e., phase-shift problems. Ever hear of "jet lag"? Of course you have! Some of you are affected more than others by this problem, and some are affected more going east to west, or vice versa. But the problem still exists. It usually only raises its ugly head when you cross four or more time zones, although it can appear at any time, especially when complicated by fatigue, altitude changes, changes in eating/drinking habits, etc. Let's face it. If you deploy to Rota, Spain, for example (providing you don't ride an aircraft carrier), you've probably crossed at least six time zones. You've been trying to sleep at a time when you'd normally be having lunch. Your clock is upset, to say the least. Look at Fig. 2. This demonstrates the mess your internal clock is in when you rapidly cross four or more time zones. Usually, you won't start feeling right again for 3 or more days.

The cure for this problem? The same as for your phase-point problem – just general considerations. But, we can add a few new ones here.

First, if you know you're going to deploy via "rapid transit," and depending on the direction you're going, go to bed an hour or two earlier or later than usual a few nights before you leave in order to start to re-regulate your clock. You'll be ahead of the game!

Second, ideally, don't fly for the first 3 days after arriving. Have safety standdowns, briefings, a free day, or whatever. Try to give your clock a chance to readjust. I've already talked with several squadrons who did things this way without really knowing the mechanism. They just didn't want their guys flying with "jet lag"!

Be aware of the problem, and adjust your habits accordingly. By the way, these effects also apply to all your squadron personnel. A fatigued maintenance person working the graveyard shift should be watched carefully for the first few days. After all, he's working on an aircraft that you're going to bet your life on!

One more thing. At a recent conference, the following additional points/findings were brought out in regard to circadian rhythm. We thought you might find them interesting.

Continued

• Frequently crossing time zones causes one to age physically at a much faster rate than those flying north to south routes. Also, apparently, the life span is shorter.

• Social interaction is more important for helping one adjust to different time zones than are such things as day/night, lighting, clocks, meals, etc.

• One's best physical performance is when the circadian physiological curve is at its highest (otherwise, efficiency is lowered by up to 70 percent, and one is more susceptible to pathology, i.e., colds, flu, etc.).

• Factors that affect one's manifestation of circadian rhythm are: personality, motivation, sleep hours, amount of physical exertion, and desynchronosis.

• There are basically two types of people: introverts – get up early in the morning, programmed behavior, have difficulty adjusting to phase shift (time changes), peak early in the evening; and extroverts – able to stay up later, adapt to shift work easier, peak later in the evening.

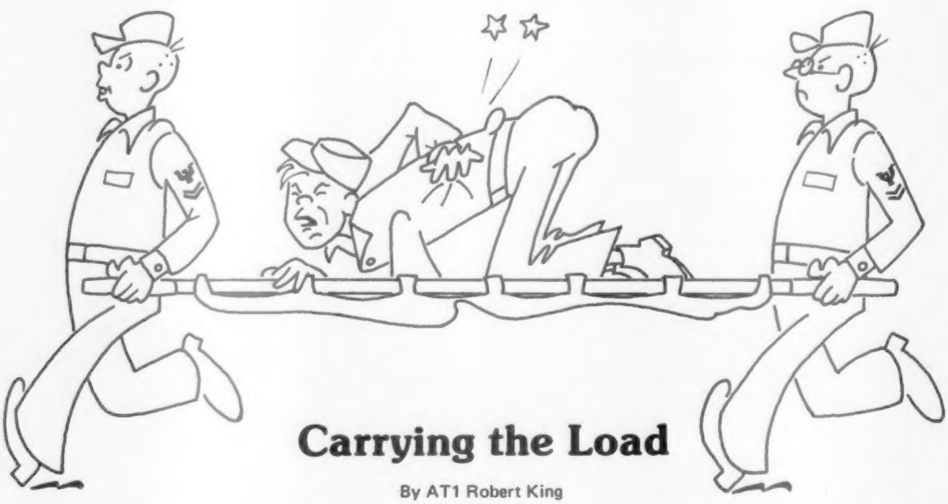
• There is no significant sex difference, although women tend to adapt slightly slower. Older people tend to have more difficulty adapting to a new time zone or phase shift.

• The effect of many drugs and alcohol depends on where one is on his circadian rhythm curve (i.e., alcohol is metabolized much slower at 0200 than at 1600-1800).

• Deaths are much more common in the morning (0600-1000).

• There is a **higher accident rate** among night shift workers, and they tend to be sicker, e.g., Mexico City DC10 crash at 0330 California time and the Three Mile Island disaster at 0400 in the morning.

• Twenty-five percent of the population has little if any problem resetting their biologic clock; 30 percent of the population either cannot adjust or adjust with difficulty to phase work (night shifts or time zone changes).



Carrying the Load

By AT1 Robert King
VP-11

There once was a sailor named Larry,
Who didn't know how much he could carry.
He picked up a box that was heavier than rocks,
And now they are carrying Larry.

RECENTLY, several individuals have injured their backs while trying to carry heavy equipment alone. In one instance, an expensive piece of electronics equipment was dropped and extensively damaged.

The reason given in each incident was: "There was no one else available in the shop to help." Due to the low manning levels throughout the Navy, this is probably a true statement. Quite often, there aren't enough people in the shop to help out, but there are people in other shops!

We must start asking for and offering our assistance when there are heavy loads to be carried or we may be helping to carry one of our friends to the hospital with permanent back damage.

BRAVO ZULU

LCDR Ron Washburn

LCDR Ronald Washburn (left) and 2d Lt Henry Jackson

WHILE maneuvering his T-28 in preparation for a practice spin, the student, 2d Lt Henry Jackson, completed the stall checklist and began a starboard clearing turn. He simultaneously closed the throttle and retarded the prop to full decrease RPM after 90 degrees of turn. At that point, the engine began to run rough. The instructor, LCDR Ron Washburn, took control and turned toward an outlying field about 10 miles away. He made preparations for shooting a precautionary emergency landing (PEL). No secondary indications of trouble were noted on the engine instruments.

Power was set at 20 inches MP and 2,000 rpm, but only 1,500-1,600 rpm were attainable. While descending at 130 knots, LCDR Washburn instructed his student to notify the outlying field of the emergency. About a minute later, the instructor noted decreasing oil pressure. A Mayday was broadcast by 2d Lt Jackson as he switched the IFF to EMERGENCY. With the oil pressure continuing to drop, LCDR Washburn placed the prop in full decrease RPM, anticipating that the engine would seize. Engine seizure occurred at 7,500 feet. The descent rate at 130 knots was well over 2,000 fpm, so LCDR Washburn elected to hold his airspeed at 115 knots, which slowed his descent rate to 1,500 fpm. He decided that he could make the high key above the OLF, choosing to ignore a preselected farmer's field for a wheels-up landing. He reached the high key about 300 feet low of the desired altitude, but made a tight turn into the low key. LCDR Washburn wanted to alert his student to pump down the flaps but couldn't because the ICS had failed. The landing gear were lowered passing the 90-degree position. Touchdown was made approximately 600 feet down the runway.

LCDR Washburn's highly professional performance during this emergency is commended. His decisive actions and adherence to SOP saved himself and 2d Lt Jackson from possible injury, in addition to saving a valuable training aircraft. Well done!

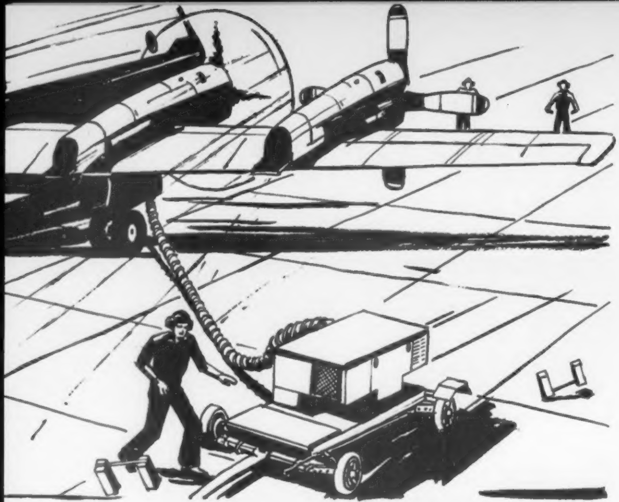
Just getting the job done

Too often in naval aviation, accidents and incidents occur which result from just getting the job done vice *getting the job done correctly.* In a number of cases, unqualified personnel performing these jobs is cited as a contributing factor. Some examples of this are described on these pages:

• Seven personnel were assigned by maintenance control to prepare a CH-46D for movement to the washrack. The crew had removed the tiedown ropes from the high point tiedown rings when the tow tractor and driver arrived from the GSE pool. The blade tiedowns were still secured to the blades and hanging free. To expedite the required move, personnel were directed to hand-carry the loose tiedowns during towing. The director, holding the forward green tiedown and wanting to position himself in front of everyone during the evolution, secured his tiedown to the passenger handrail on the tow tractor. This was done to prevent the rope from being run over by the aircraft or tow tractor. As the movement proceeded and the tractor commenced a left turn into the wash area, the secured tiedown rope became taut and the blade began to bend. Attempts by the director and the starboard wingwalker to halt the evolution by yelling at the driver were unsuccessful. The blade buckled.

A lack of supervision was a factor in this ground accident in that a member of the crew who was not designated as a plane captain was allowed to act as the director. The director's decision to secure the loose tiedown to the tow tractor and the tractor driver's allowing the rope to be attached to his vehicle indicate inadequate training. Inadequate training is also highlighted by the fact that the director and the wingwalker, while watching the initiation of this incident, failed to use the whistles in their possession to stop the evolution. In fact, of the four members of this crew who possessed whistles, only one had it physically in his mouth. That crewmember was positioned on the port side of the aircraft, however, and did not observe the incident.

Five of the seven members of this crew were qualified plane captains, yet an unqualified crewmember was assigned as director. Supervisors must remain aware of the qualifications held by their subordinates, and personnel must not accept assignments for which they are not qualified.



• A qualified P-3 flight engineer (FE) was directed by maintenance control to perform a low power maintenance turn for a fuel governor pitch lock check on a newly installed engine. An AD1 went along to act as brake rider. The line division dispatched two trainees to act as linemen. An NC-10 power unit was positioned in front of the No. 3 engine and a GTC-85 huffer was positioned behind the No. 4 engine. Neither of the line trainees was licensed to operate the GSE.

The FE, unaware that the linemen were unqualified, briefed the men on what was to take place. They acknowledged that they understood the procedures. After a normal start of the No. 2 engine, the FE signalled for a disconnect of the huffer and power unit. This was acknowledged by the linemen, but only the NC-10 had been disconnected and pushed clear of the aircraft. The FE requested and was given clearance by the lineman for No. 3 engine start. After normal start, the FE asked for and received clearance by the lineman to add power.

The FE applied 1,500 SHP to No. 2 and 3 engines. The addition of power blew the chocks out from under the GTC-85 huffer and it began to roll away with the hose still connected. The lineman in front of the P-3 began giving the FE the signal that is used for a taxiing aircraft to slow down. Not understanding this signal, the FE observed the second lineman, on the starboard side of the aircraft, giving a *chocks-in* signal. The FE had already been given signals to indicate both the NC-10 and the GTC-85 had been disconnected, so he did not associate any possible danger from those units, only that the linemen were concerned about the aircraft chocks. Confusion was generated between the crew inside and the crew outside the P-3 over the hand signals.

The AD1 brake rider then noticed the lineman in front of the aircraft give the engine cut signal. The FE did not see this, but because of the confusion, he reduced power to the ground range and went to the starboard over-wing hatch, opened it, and looked out. Seeing that the huffer was still connected, the FE returned to the cockpit, fuel chopped the No. 3 engine, and performed a battery shutdown on the No. 2 engine.

This "routine" operation came close to having catastrophic results. At least five squadron and higher-authority instructions were violated, any one of which, if complied with, might have prevented this incident. Qualified line personnel were available but not utilized.

• An A-7E was being handled by a plane captain trainee who was under the supervision of a qualified plane captain. During his walkaround of the aircraft, the pilot informed the trainee of the low oil quantity showing on the sight gage. While the pilot was manning the *Corsair*, the trainee removed the oil cap, without the pilot's or the supervisor's knowledge, under the assumption that the oil was to be serviced. The trainee forgot about the cap until an oil leak was discovered after power was applied.

The trainee had just returned from leave a few days before and, prior to leave, was considered one of the better and more advanced trainees. It appears he was *rusty* on procedures since SOP requires that a servicing cart be at the aircraft and ready to service before the oil cap is removed. Too many assumptions on the trainee's part could have resulted in the loss of a pilot and aircraft had the A-7 launched.

The above incidents illustrate what can happen when unqualified or untrained personnel perform jobs they shouldn't. While a *can-do* or *gung-ho* attitude is admirable up to a point, the ultimate requirement is to **get the job done correctly**. This is the only way accidents and incidents can be appreciably reduced.

A SUBJECTIVE LEAP

By Maj V. L. McMinn
Naval Safety Center

IN case you are immediately turned off by semantic discussions, let me start by summarizing my point: the "subjective leap" is from *currency*, which we can legislate in orders, directives, and SOPs, to *proficiency*, which is much harder to pin down.

Currency is an empirical state of competency that can be very accurately defined by higher echelon and, as such, is easy to control. The Training and Readiness Manual used by Marine Corps units is, by present standards, the epitome of efforts in attempting to qualify a pilot's currency. It is broken down into missions and phases of missions and employs such technical jargon as *refly factors* and *combat readiness percentage*. Individual NATOPS manuals contain currency requirements, usually in the area of FCLP/CQ. Some squadron, group, and wing SOPs contain stringent night and/or cross-country requirements and, of course, OPNAVINST 3710.7 must receive honorable mention as the baseline for determining operational currency in the aviation community.

Wherever it is defined, currency is usually reduced to flying a certain type of hop within a specified time period. The assumption is that, if an aviator is *current*, he will be able to perform adequately. With currency so well defined, why then do we continue to have accidents such as these:

"Ramp strike at night. Pilot was current in accordance with pertinent instructions but had displayed an increasing propensity for starting high on final."

"Flew into ground at night. Pilot had completed night currency requirements at a civil airfield with a lighted runway. Crash occurred while orbiting an improperly lit landing zone."

A reasonable explanation is that *current* does not mean *proficient*. If you like catchy axioms, then try this one: "A pilot must be current to be proficient but does not have to be proficient to be current." What, then, is proficiency?

I suggest that proficiency, i.e., the ability to perform adequately, is the real goal of our currency programs. If our currency program is inadequate, as indicated by repeated involvement of *current* aviators in pilot-related accidents, what is missing?

Currency is usually the purview of the people who write the flight schedule, but let me suggest that the question of proficiency falls to the NATOPS officer and the flight surgeon. Remember all the articles over the last several years in *APPROACH, TAC Attack, Aviation Digest,* and other publications dealing with stress, fear, and other emotional conditions? It is not always valid to say that an aviator is able to leave his problems on the ground. The flight surgeon should be able to

pick up signs of a deteriorating psychological climate. This requires that s/he (a) spend several hours a week in the squadron area, (b) attend AOMs/APMs, (c) participate in squadron social functions, (d) participate in flight operations, and (e) participate in operational planning and execution, especially during periods of intense operations. The flight surgeon can properly perform his or her duties only if s/he is intimately involved with squadron activities.

The psychological temperament of a pilot also includes environmental factors at work (i.e., job contentment, role conflict, military requirements, career problems) and at home (family, money, etc.). Changes in any of these areas will affect a pilot's ability to perform. Picking up behavioral cues that may indicate reduced proficiency is not only the purview of the flight surgeon, but also of the NATOPS officer.

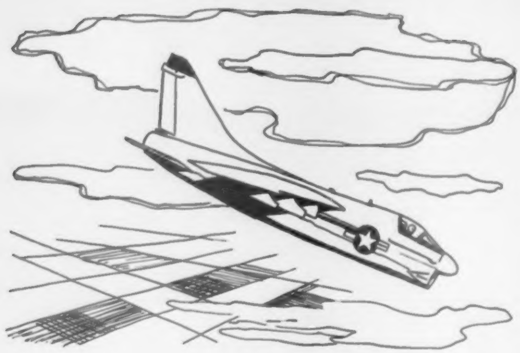
The NATOPS officer also determines the performance parameters by which a pilot's ability to perform can be measured. What constitutes low and slow? Is that more significant than high and fast? Is a trend of poor technique emerging in a pilot or in a group of pilots? What is the significance of the continued absence of this pilot from ground training?

As discussed herein, the functions of the NATOPS officer and the flight surgeon are primarily the subjective evaluation of possible trends that may affect a pilot's ability to perform adequately. But these two officers are potentially much more valuable to a command than has yet been implied.

As advisors on aircrew assignment, they should be instrumental in attempts to integrate a pilot's flying skill with the demands of a ground billet. They should be consulted every time a pilot is considered for a new designation or mission qualification. They should have roles in the reassignment of aircrew personnel within the squadron. They should be members of any type of screening board a command may have. They should be on the ground level of crew roster preparation and operational planning. This last is obviously the purview of the commanding officer. Commanding officers are, after all, the people ultimately responsible for tying the whole thing together. It is natural for the CO to be concerned about the *proficiency* of his pilots.

In summary, currency can be maintained by an interested schedules officer. It takes close teamwork between pilots, the schedules officers, the flight surgeon, and the NATOPS officer, along with support and direction from the commanding officer, to achieve and maintain a state of proficiency, which is what we're really after.

An open letter to fellow "Brown Shoes"



By LT C. A. Simmons
VA-22

I HAVEN'T been in the readyroom lately when there hasn't been some complaining about a lack of flight time and a lack of quality in flying. Many of the gripes concern too much positive control and not enough realistic training. The arguments are endless, and I firmly believe that there is some justification for them. Unfortunately, there are some things that are not going to change – the positive control environment is here to stay and will likely become more restrictive. With the cost per flight-hour reaching four figures, the days of unlimited flying are probably long gone, as well.

It is often said, especially by the "old salts," that positive control erodes the basic air skills of aircrews, discourages them from thinking for themselves, and is responsible for a lack of flexibility and adaptability in the more junior pilots. They say since 90 percent of all flying is accomplished in this environment, aircrews never stay proficient in their airplanes. They never fail to add that pilots and crews have become slaves to the black box. Because of the sophistication of modern naval aircraft, the airplane has gradually assumed control of the crew.

The basic truths that underlie these common observations touch a fundamental weakness at the core of naval aviation. Aside from individual ability, a pilot or aircrewman is merely a product of his training environment. If there is a flaw in the capabilities of the aircrews in general, it is due to a flaw in their training.

An examination of several accident reports and the results of recent readiness exercises lead to some obvious conclusions. There is a critical need for renewed emphasis on basic flying skills and for the development of a training plan that will *really* meet the requirements for combat readiness. Positive control is not the villain, although it makes a convenient scapegoat. The fact is, training has failed to keep pace with the rapid advancements in aircraft systems technology. Aviators are not adequately prepared for dealing with complex aircraft systems and mastering the aerodynamics of their airplanes. We are locked into the "assumption" mode. We assume that because at one time each aviator has mastered the fundamentals of flying, he will always remain proficient in them. Unfortunately, we are finding that these assumptions are not necessarily valid. Though it may be true that overall safety in naval aviation is improving, the percentage of mishaps directly related to pilot error is not so impressive.

It is past time to take a hard look at our training process. We have let ourselves assume too much while desperately attempting to get all those "blocks" checked off. The training of psychomotor skills should never stop. The best athletes in any professional sport continue daily drills of the same fundamentals they learned as children because it is those fundamentals that win ball games. The parallels between professional athletes and naval aviators are obvious, except that the aviator plays for much higher stakes. We need to drill the fundamentals to make certain that we can, above all, fly the airplane.

The key man in the game is the training officer. He must ensure that the flight schedule is written according to the training needs of each aviator in the command. His training plan must include a heavy emphasis on fundamentals which systematically incorporate the total weapons system for maximum pilot capability and effectiveness. He needs command support to make individuals accountable for maximum training and quality in every flight hour. The responsibility for training should be placed upon every section leader, division leader, and aircraft commander in the squadron. In the end, there is no excuse for not flying the airplane. Each aviator must be able to efficiently budget his time in the cockpit and establish for himself an order of in-flight priorities.

To achieve the ultimate goal of combat readiness, we must realize the importance of individual state of mind. An emphasis on the basic "head out of the cockpit and feet on the rudder pedals" will result in a competent aviator.

And with respect to the combat mission, this emphasis will result in an attitude of aggressive confidence in the manipulation of the machine. This control will be the deciding factor in combat survivability. So, let's put the *stick and throttle* back into flying and stress the fundamental precept of naval aviation – **aviate, navigate, and communicate.** ◄

SURVIVAL/POSTEJECTION PROCEDURES

In-water Liferaft Deployment Sequence A-4, TA-4, A-7, TA-7, and S-3 Configuration
(No G-suit for S-3 crews)

By CDR Jack Greear, MSC, USN
APTU – Norfolk
NAVREGMEDCEN, Portsmouth, VA

THE following scenario describes step-by-step procedures for in-water liferaft deployment and inflation utilizing the RSSK-8 with ACC-377. This is the first of two possible techniques, with the second to be published next month. The emergency egress situation is a low-altitude ejection, over water, in which ejection systems have functioned normally. The aircrewman has been able to inflate his LPA and release his parachute upon water entry but has not had time to deploy his liferaft.

Although the RSSK illustrated is a RSSK-8 with ACC-377, other single-handle RSSKs may be deployed in the water in the same manner. The raft release handle will always be on the right-hand side. Its actual location, however, may vary fore and aft from the illustrations. In addition, on Martin-Baker systems, the parachute container will not be attached to the RSSK.

These techniques are being published in advance of the NAVAIR-00-80T-101 Survival/Egress Manual for two important reasons: first, so they will get to the fleet as soon as possible; and second, so that the project manager may receive any possible feedback on these procedures before NAVAIR-00-80T-101 is finally printed. Please forward any comments to: Commanding Officer, Naval Regional Medical Center (Code APTU-230), Portsmouth, VA 23708.

1. Raise visor.

2. Remove oxygen mask.

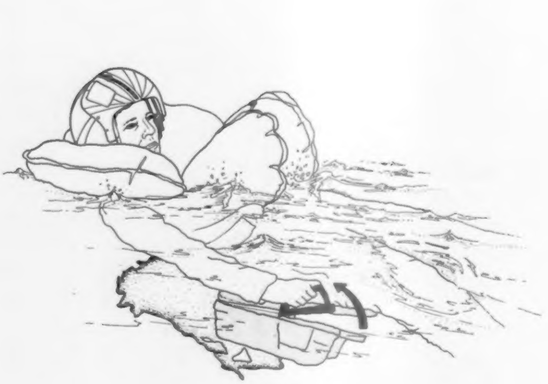
3. Remove gloves, if desired, and stow for later use.

Continued

NATOPS evaluators for in-water use of LSE are CDR Bob Elzy, MSC, USN and PR1 R. W. Jablonowski, USN.

4. Locate raft release handle.

5. Grasp raft release handle.



6. Firmly pull up and back on handle until free of kit. (Parachute container will now be free of RSSK.)

7. Retrieve lower half of kit.

8. Grasp and remove liferaft from lower half of kit.

9. Hold liferaft with one hand and pull valve actuating line with the other. **(Warning: Do not hold CO_2 cylinder, as it becomes quite cold when discharging.)**

10. Liferaft inflating.

11. Liferaft inflated (liferaft may not appear to be fully inflated until CO_2 warms up and expands).

Artwork by Carolyn Dinicola Fawley.

The best pilot in the squadron

By Maj Michael T. Fagan, USAF

NOT long ago, as an unproductive happy hour wound to a close, several of my flying colleagues and I were gathered around the dregs of the last pitcher. The beer was almost too flat to drink. As is often the case when aircrewmembers "stand to their glasses," the conversation drifted from war stories through "where is ol' so-n-so," to memories of those no longer with us.

Some had been recruited by the airlines and some had gone to other jobs, but the talk centered on one of our number who had met an untimely end on a desert gunnery range. If there is a special eulogy for a pilot, it is not delivered by a chaplain from a pulpit – it is spoken by his squadronmates in the bar as the happy hour crowd thins out and the beer gets warm. No congregation could be more sad-faced. No higher praise could be given. The ceremony is as predictable as any formal funeral. Sometimes there are even hymns of a sort, and green Nomex is a kind of vestment.

It was an unfortunately familiar scene to most of us who had been around for a few years. Inevitably, someone said, "Yeah, he was the best pilot in the squadron." All who knew him nodded their heads in silent accord.

He certainly had been a memorable figure. He had been assigned to the standardization board as a lieutenant. An academy graduate, his bearing and conduct were exemplary. He knew his NATOPS down to the publisher's initials and was an authority on all the "non-boldface boldface" published by NAVAIR on down. Though he got to sea too late for the hot part of the conflict, he extended until the very end and played a highly decorated part in the evacuations and the Mayaguez affair. He was always chosen to lead the tough missions and earned the total respect of his superiors at all levels. His exploits were legendary. He was the one who went to the development conferences and flew the test program. His physical appearance was striking, he was well ahead in his designations, he was always available when the schedule changed at the last minute, and he more than pulled his weight in the additional duty department. Besides that, he was a nice guy. No one was surprised when he was selected for major below the zone.

He was the best pilot in the squadron.

It does not pay to speak ill of the dead, but wait a minute! If he was so good, why is he dead? At the risk of asking a sacrilegious question, how about those other well-remembered colleagues who have been honored with the posthumous title of "best pilot in the squadron"? Is there something about being the best that is fatal? What good is being the best if it kills you? What good is having the best in the squadron end up in a box when he is needed in the cockpit? Let's take another look at this paragon of pilot virtues.

He was aggressive, ambitious, and confident. These are admirable qualities – in fact, they are requirements for the job. There is, however, an important distinction between

confidence and overconfidence, aggressiveness and overaggressiveness, and even achievement may be overdone, or done too fast.

He had required a little command assistance to transition into a new weapons system as late as he did, but no one was surprised when he got it. That he was killed on a range *was* a surprise. He had a lot of low level experience. He liked being down in the weeds, and he was good at it. The investigators found nothing wrong with the aircraft. It appears that he simply flew into the ground after pulling off the target. He either didn't hear the "knock it off" call or it came too late. In any case, he got low enough to prompt a call and apparently did not react to it prior to impact.

Could there have been a malfunction? He had previously demonstrated exceptional ability to bring the aircraft home when another pilot might have landed at an intermediate point, even though maintenance would have been inconvenient and the squadron would have bought a bunch more downtime. He was good enough (and mission oriented enough) to take a bird with minor discrepancies, work around them, and get the job done. He was a mission hacker. "Ya gotta be tough . . ." he had said more than once. It probably wasn't a malfunction. He could have handled any malfunction small enough to be missed by the investigators.

The flight was a late afternoon launch, but there is no reason to believe that he had been fatigued. He was not a heavy-drinking man, and he had no duties which would have conflicted with crew rest. Besides, during the Mayaguez mission he had demonstrated that he could perform when tired. He had flown sortie after sortie, on his own adamant insistence, even though there were more rested pilots available. He kept getting an airplane despite fatigue. After all, he was the best pilot in the squadron, and that was one tough mission. A little fatigue wouldn't have bothered him.

He bought the farm on a checkride, but stress couldn't have been a factor – he always did well on checkrides. In fact, stress may actually have improved his performance. In Vietnam he earned a medal for going in on the hottest objectives. In one case, he went in a third time after being shot off twice. Now, that's stress! No . . . he was not one to choke under pressure.

In the final analysis the report concluded that the cause of the accident was "pilot distraction" or "disorientation." In other words, what used to be called pilot error. But errors are not something one would expect from the best pilot in the squadron. On the other hand, if he had not "gotten caught," no one would have ever suspected that he had been disoriented or distracted. He had exhibited no such tendencies, or at least none had been recognized.

But it only takes one incident or one mistake. It's hard to make a habit out of having fatal accidents. The diagnosis has to come before the fact in order to do any good, and it's no easy task.

The distinction between the spirit of attack and dangerous lack of caution is not always readily apparent. What looks like normal aggressiveness may be termed recklessness after an accident. Spirit, however, is a prerequisite, and an excess of caution is self-defeating. A force of timid pilots, reluctant to take any risks, is not acceptable. Neither is a corps with the disdain for death inherent in kamikazes (especially if training flights are required). What is required are pilots with the will to accomplish the task at hand, but the sense to recognize that a given result is not worth the loss of an aircraft and crew. This is especially true in a training or peacetime environment.

During the early seventies, when Vietnamese aviation cadets were receiving primary training in the United States, one Vietnamese training officer would address each arriving class with the following safety philosophy: "Each student must become the best possible pilot. That requires both nerve and skill. Since the mission doesn't end with a single sortie, a good pilot must be available to fight tomorrow. Good pilots bring both themselves and their airplanes home. Dead pilots are bad pilots. The loss of an airplane in training is as detrimental to the war effort as a direct hit from a SAM. Sometimes it takes nerve to refuse an aircraft or abort a mission. That's part of what it takes to be a good pilot – nerve."

So what does this have to do with the pilot who is the subject of this tale? Little or nothing. Flying safety lectures will do him no good now, and apparently didn't do him enough good when he was alive. All those monthly meetings, special briefings, and bulletin boards weren't enough to keep him alive. Neither were his skilled, highly trained hands and feet, vast knowledge of regulations and procedures, or extensive experience. For all his education, ability, and desirable attributes, his final professional act was costly and wasteful. He destroyed a valuable aircraft and killed its pilot. At the very best, he did not prevent the loss, and he was the last person who could have done so.

The best pilot in the squadron? He's still in the squadron. He, too, knows the books, has the skills of a brain surgeon, and reeks of moxie, but he comes home with his airplane intact. Maybe it's that little bit of extra for Mom and the safety officer. Who knows? One thing is for certain, though, the best pilot in the squadron will get the job done without unnecessary losses. While he's there to fly and fight, he knows that broken birds stay on the ground and dead pilots don't defeat anybody.

The pilot's epitaph will, unfortunately, be occasionally intoned in the bar while the ice melts and the happy hour crowd drifts out the door with the smoke. It's a traditional way to honor our dead. But in the meantime, let's be honest – here's to the real best pilot in the squadron. The one who's still with us.

Adapted from AEROSPACE Safety

LETTERS
to the editor

Congratulations!

APO, New York – I have just received the JUL '80 Anniversary Issue of APPROACH and am almost in shock after reading VADM Schoultz's article "Command Climate." For the first time, a *heavy* has come out and put a finger on one of the major causes of our needless loss of lives and aircraft in naval aviation.

I am not implying that command responsibility has not been mentioned before in safety circles, but for the first time your readers have been told, in a most impressive manner and by someone who has a handle on the problem, what we have all known for years. Each aviator can put several names to "the skipper putting his bird through some maneuver specifically prohibited by directives just to satisfy some ego urge." How many of us have had to scrape up some less capable JO who tried to emulate such a "leader"?

This type of "call it as it is" has been lacking in our rarified way of life. I would bet anyone a "tray of Cubi Specials" that we would see a lower accident rate throughout naval aviation and a more positive *esprit de corps* (retention maybe?) if more attention was placed on this part of the problem as so ably described by COMNAVAIRPAC.

Keep up the good work and let's see more "straight shooters" take a pen in hand (or an axe, if necessary).

CDR John C. Moore

Safety – Who Is Responsible?

FPO, New York – As I was rummaging through my mailbox today, I found the following tidbit of wisdom given to me by VAW-124's safety petty officer, AME1 Dick Hardy. I think this note says it all, and I hope you will share it with all who are concerned with safety.

Safety is not something one can take or leave. It is not an activity that is participated in only when one is being watched or supervised or when there's a safety officer around. Safety is not posters, slogans, or rules, nor is it movies, meetings, investigations, or inspections.

Safety is an attitude – a frame of mind. It is the conscious awareness of one's environment and actions all day, every day. Safety is knowing what is going on, what can injure someone or damage anything. It is knowing how to prevent that injury or damage and then acting to prevent it. To do this does not require a genius, a Ph.D., or even a title or rank. All it requires is intelligence and a reasonable amount of native ability to see, hear, smell, and THINK. To ignore safe practices does not indicate a brave person, only a foolish one. To do things safely and correctly is the mark of a wise man, not a timid one.

LCDR T. G. Trethewey
VAW-124 Safety Officer

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Correction

The cover art on our DEC '80 issue was incorrectly credited as an A-6 *Intruder.* The painting was obviously an EA-6B *Prowler.*

Safety Posters

THE Naval Safety Center no longer prints or stocks safety posters for order by the fleet. Safety posters are routinely printed on the inside and outside back covers of all Naval Safety Center publications, however. In addition, full size posters will be printed on a periodic basis for each operational community, and these will be automatically distributed to the appropriate commands.

If you have an idea for a safety poster, either for the magazine or as a separate poster, please submit it to: Naval Safety Center, Safety Publications Department (Code 70), NAS Norfolk, VA 23511.

Don't forget to cut the back covers off some copies of APPROACH and post them around your command. After all, they aren't posters until you hang them up somewhere!

☆U.S. GOVERNMENT PRINTING OFFICE: 1980–735-003/23

1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
1 ATTA BOY
+ 1 DELTA SIERRA

—10 ATTA BOYS

Poster idea contributed by ABH3 Robert Gerald Curran, VP-48, Moffett Field, CA.

Naval Safety Center
NAS Norfolk, Virginia

REUSABLE CONTAINER

DO NOT DESTROY!

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by AO1 Gregory B. Scott, USNR (TAR), NAS Jacksonville, FL.